

THANKS FOR PURCHASING OUR PRODUCT

AC/DC315D

DC INVERTER
AC TIG/DC TIG/MMA
WELDING MACHINE

OPERATING INSTRUCTIONS

(SUITABLE FOR 3x380V~415V)

SAFETY PRECAUTIONS

Follow these precautions carefully. Improper use of any welder can result in injury or death.

1. ONLY CONNECT WELDER TO A POWER SOURCE FOR WHICH IT WAS DESIGNED.

The specification plate on the welder lists this information. When welding outdoors, only use an extension cord intended for such use.

2. ONLY OPERATE WELDER IN DRY LOCATIONS and on concrete floor. Keep area clean and uncluttered.

3. KEEP ALL COMBUSTIBLES AWAY FROM WORK SITE.

4. DO NOT WEAR CLOTHING THAT HAS BEEN CONTAMINATED with grease or oil.

5. KEEP CABLES DRY AND FREE FROM OIL AND GREASE and never coil around shoulders.

6. SECURE WORK WITH CLAMPS or other means; don't over reach when working.

7. NEVER STRIKE AN ARC ON A COMPRESSED GAS CYLINDER

8. DON'T ALLOW THE INSULATED PORTION OF THE ELECTRODE HOLDER TO TOUCH THE WELDING GROUND WHILE CURRENT IS FLOWING.

9. SHUT OFF POWER AND UNPLUG MACHINE WHEN REPAIRING OR ADJUSTING.

Inspect before every use. Only use identical replacement parts.

10. FOLLOW ALL MANUFACTURER'S RULES on operating switches and making adjustments.

11. ALWAYS WEAR PROTECTIVE CLOTHING when welding. This includes: long sleeved shirt (leather sleeves), protective apron without pockets, long protective pants and boots. When handling hot materials, wear asbestos gloves.

12. ALWAYS WEAR A WELDER'S HELMET WITH PROTECTIVE EYE PIECE when welding. Arcs may cause blindness. Wear a protective cap underneath the helmet.

13. WHEN WELDING OVERHEAD, BEWARE OF HOT METAL DROPPINGS. Always protect the head, hand, feet and body.

14. KEEP A FIRE EXTINGUISHER CLOSE BY AT ALL TIMES.

15. DO NOT EXCEED THE DUTY CYCLE OF THE MACHINE. The rated cycle of a welding machine is the percentage of a ten minute period that the machine can operate safely at a given output setting.

16. KEEP ALL CHILDREN AWAY FROM WORK AREA. When storing equipment, make sure it is out of reach of children.

17. GUARD AGAINST ELECTRIC SHOCK. Do not work when tired. Do not let body come in contact with grounded surfaces.

I. MAIN USAGE AND THE RANGE OF USAGE

AC/DC315D Welder is a triple functional machine used as DC MMA, AC TIG, DC/PULSE TIG Welder. All ferrous metals, copper, aluminium, titanium and stainless steel material can be welded from all positions. The welding current is stable and the stepless is adjustable. Few spatter and low noise occurs during welding. The welder is compact, light in weight and easy to move. It is suitable for pressure vessel, building, shipping and petrochemical industries. It is the priority product to replace the NSA series welding machine.

II. MAIN TECHNICAL SPECIFICATIONS

MODEL		AC/DC315D
INPUT	Voltage	3xAC 380~415V 50Hz
DC MMA	No-load Voltage	70V
	Base current Adjusting Range	10~250A
	Rated Output Current	250A
	Rated Duty Cycle	60%
AC TIG	No-load Voltage	70V
	Current Adjusting Range	20~315A
	Initial current/crater-fill current	20-150A
	SP % (AC balance)	10~90
	AC Square Wave Frequency	20~150Hz
	Rated Duty Cycle	60%
DC PULSE TIG	BASE/PULSE Current Adjusting Range	10~315A
	Rated Duty Cycle	60%
	Current UP/Down-slope Time	0~25S
	Pulse freq.	0.5~25Hz
	Pulse width	5%~95%
	Initial current/crater-fill current	10A~150A
	Pre gas Flow Time	0~10s
	Post gas Flow Time	0~25s
	Arc starting Mode	high frequency arc striking
Efficiency		≥80%
Mass		25kg
Protection Class of enclosure		IP21S
Outline Dimensions mm ³		430x200x290

III. OPERATING CONDITION AND WORK SURROUNDING

1. Operating condition:

Voltage of power source: 3xAC 380 V/400V/415V。

Frequency: 50/60Hz

Reliable grounding protection

2. Work surrounding

- ① Relative humidity: not more than 90 %(average monthly temperature not more than 20C);
- ② Ambient temperature:-10C - 40C;
- ③. The welding site should be free of harmful gases, chemicals, molds and flammable, explosive or corrosive materials;
- ④. Avoid operating in damp or wet conditions

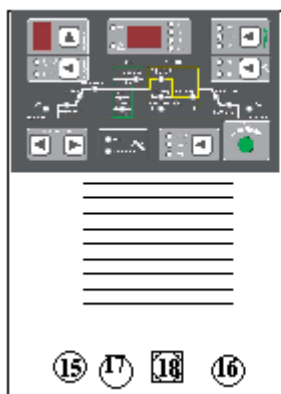
IV. OPERATING INSTRUCTIONS

1. Before welding, the operator should read the operation instructions.

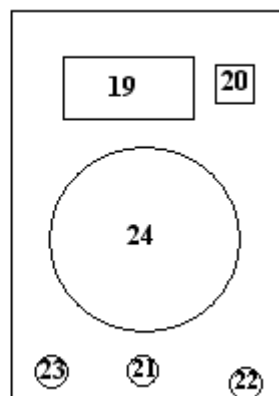
2. Check the welder appearance for any damage before operation.
3. To ensure safe operation, the welder must be grounded correctly according to your local power supply system using a 4mm² lead to connect the welder to the ground.
4. Welding operation should be carried out in dry and well ventilated areas and conditions. Surrounding objects should not be less than 0. 5m away from the welder.
5. Check the welder output connector for tightness.
6. The welder cannot be moved and the cover cannot be opened while the power is on and welding operation is carried out.
7. The welder should be cared for, used and managed by trained personnel.
8. Current of the distribution board: not less than 40A

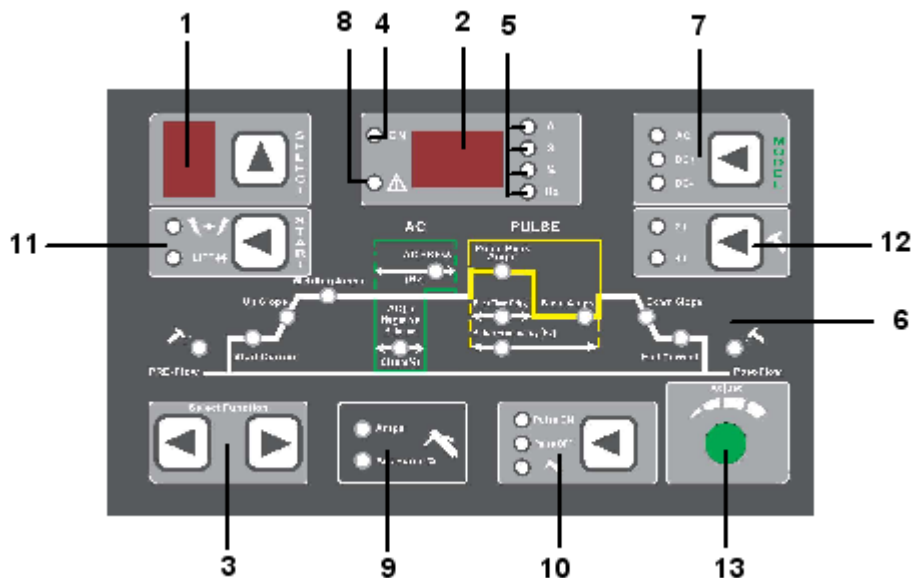
V.SKETCH SKETCH THE PANEL FUNCTION

1. FRONT PANEL



2. BACK PANEL





1. Memory channel LED
2. Data Display meter
3. Parameter Select function
4. Power Indicator
5. A -- current display indicator

S -- Up & down slope; time & pre & post flow time adjustable

% -- unit of AC balance & peak time on

Hz -- unit of pulse frequency & AC frequency.

6. Indicator light for Parameter Select function (Pre-flow/ Start current/ Up slope/ Welding Amps/ AC freq/ AC balance/ Pulse peak amps/ peak time on/ pulse freq/ base Amps/ down slope/ end current/ post flow)

7. AC/DC+/DC selector

8. Warning indicating light

9. MMA AMPS/arc force selector

10. Pulse on/pulse off/MMA selector

11. HF/LIFT selector

12. 2 steps/4 step selector

13. Data Display Adjustment Knob

15. Output "+" (Welding holder)

16. Output "-" (Ground clamp)

17. Argon out

18 argon arc control (or remote control)

19. Name plate

20. Power switch

21. Argon inlet22. Power supply

23. Safety earthing column

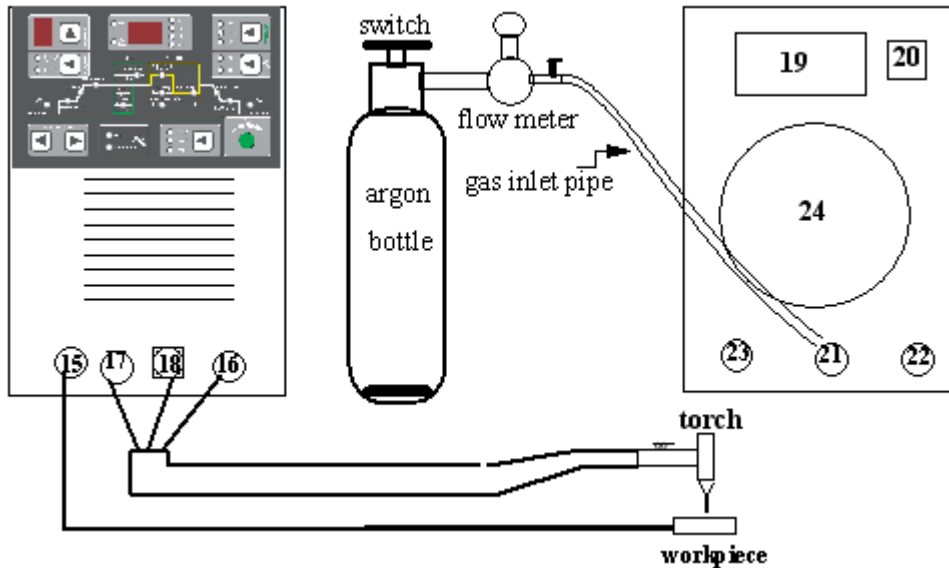
24. Fan

VI.METHOD OF THE OPERATION

1. ARGON ARC WELDING (TIG)

a. FRONT OF WELDER

b. BACK OF WELDER



1.1 CLEAN BEFORE WELDING

Tungsten argon welding is very sensitive to surface contamination. Therefore ensure material is clean and free from all contaminants including grease, paint, lubricants and rust. Use an appropriate pre-cleaner if necessary

1.2 DC ARGON ARC WELDING

①Select "10" on the "pulse off" position and select "7" onto the "DC+" position, connecting the gas inlet pipe to inlet "21" of the welder.

②Connect gas inlet pipe of the welder torch to argon output of welder "17".

③Put the control plug of the welding torch in the argon arc control socket "18".

④Testing the gas: turn on the main power and switch on the welder and switch on power setting

⑤Regulating the base current knob "13": Select welding current according to the thickness of the material to be welded. Select current down slope time and after flow time according to the current.

Notice 1: The current indicating meter on the front panel is used to display the preset output current level before welding and actual output level while welding: A lit display indicates that the input power is turned on.

Notice 2: When using the 'Adjustable foot control' regulator, current will increase gradually when you step on the 'Adjustable foot control'

⑥Ensure Tungsten electrode end is 2-3mm away from the welding material. Press the torch

switch, to strike an arc.

Notice 3: During welding, with the "12. 2T/4T" mode on "2T" mode, the torch trigger should be held at all times and must not be released. Otherwise the arc will extinguish.

⑧. When the welding operation is finished, close the valve and turn off the power.

1.3 PULSE ARGON ARC WELDING

① Select peak current and base current:

② Select "10" onto the "pulse on" position and select "7" onto the "DC+" position.

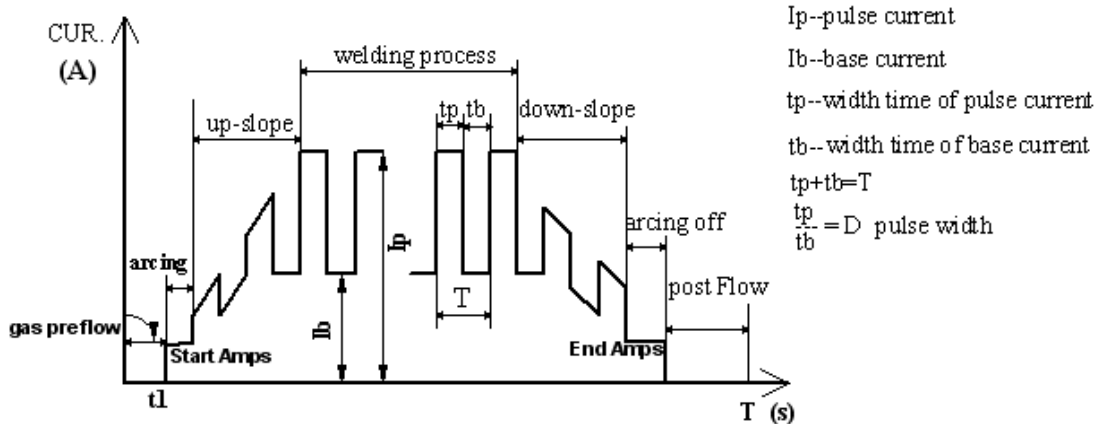
This will change the frequency between 0.5-25Hz.

③ Select peak time on ratio: It can be selected between 5%-95%.

④ Select up-slope & down slope time: It can be selected between 0-25 seconds.

⑤ Gas connection, testing, generating and post flow time use the same procedures as DC arc welding.

1.4 PULSE ARGON TUNGSTEN WELDING PROCESS (only for reference)



① Features and application scope of the process

The pulse type argon tungsten welding is different from the continuous (DC) argon welding. The welding current is pulsed. The wave form of the current is shown in the sketch above. I_p and I_b and their continuous time t_p and t_b can be regulated according to requirements of the process. The amplitude value of electric current changes periodically with certain frequency in case of the pulse current, molten base will be formed in the work piece and the molten bath will solidify. The welding seam is formed by reciprocal overlaps. Welding heat input can be controlled by regulating pulse frequency, pulse current amplitude, size of base current, continuous time of pulse current and base current and therefore the welding seam, size and quality of the zone influenced from heat can be controlled.

② Advantages and application scope of pulse argon gas tungsten arc welding

a. Precisely control the size of the bath inputting heat to the material to increase penetration resistance of molten seam and preservation of bath. It is easy to obtain even fusion deepness.

b. Heating and cooling of each welding point is very fast. Therefore, the process is applicable for the material with great difference of heat conductivity and thickness.

c. Pulse arc can obtain greater fusion deepness with lower heat input. Therefore under the same condition, the zone influenced from the welding heat reduces the possibility of distortion from welding. This is very important for sheet and ultra-thin sheet welding.

d. Fast cooling of the bath metal and short duration time of high temperatures during welding can reduce cracks caused to the thermo-sensitive materials during welding.

③ Selection of welding parameters

Except for pulse current, width time (width ratio) and pulse frequency, welding parameters of pulse argon gas tungsten arc welding are the same as general tungsten DC argon arc welding. Increasing pulse current means electric arc can obtain greater penetration ability. However, too much current can cause local melting of tungsten electrode. Generally, welding current required for DC tungsten argon arc welding uses greater current. The arc holding current and base current influences the cooling and crystallizing of the metal in the bath. The range is determined by the performance of the welding materials. When the sheet is being welded, smaller arc holding current (base current) is usually used in order to reduce the possibility of blowing holes through the sheet/material and reduce the possibility of sheet/material distortion. When pulse width ratio (holding time of pulse current and base current) is selected, both the heat input and features of pulse welding should be considered. Usually, it can be selected between 10% - 90% . Selection of pulse frequency (periodical change time of pulse current) mainly depends on the thickness of the sheet and welding speed. The customized settings of the operator should also be considered for the pulse width ratio.

1.4 AC ARGON ARC WELDING

1. Select "7" onto the position "AC", connecting the gas inlet pipe to inlet "21" of the welder.

2. The method of the connection same as 1.1

3. Select right "sp(AC Balance)"

$$SP = \frac{t_p}{t_n} * 100\%$$

t_p : the time of I_2 at positive

t_n : the time of I_n at Negative

4. Select right AC square wave frequency and AC balance.

5. The Method of the welding is the same as 1.1

2.Hand welding with electrode

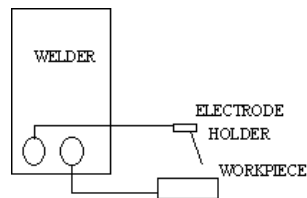
1. Connect input power for the welder, then switch on the power. The Data Display Meter ("2") light will switch on.
2. Select "10" onto the position "MMA"
3. Select right welding current; select empiric formula: $I=40d$, d is dia. of the electrode.
4. Notice positive and negative connections during welding.

A. NEGATIVE CONNECTION

select "7" onto the position "DC+"

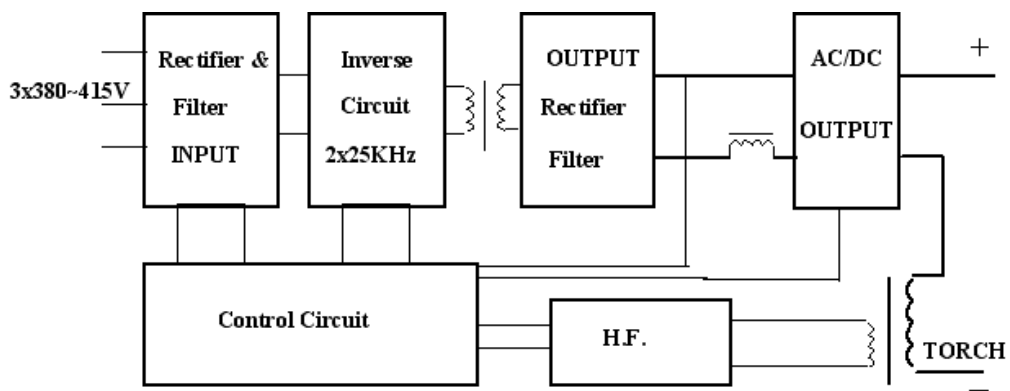
B. POSITIVE CONNECTION

select "7" onto the position "DC-"



5. Pay attention to the rated welding current and the rated duty cycle of the welder. Overload is not allowed.
6. After the welding operation is finished let the welder cool down for a few minutes before cutting off the power switch.

VII.SYSTEMATIC BLOCK DIAGRAM



This product is sold subject to the understanding that if any defects in manufacture or material shall appear within 12 months from date of consumer purchase/sale, the manufacturer will arrange for such defects to be rectified without charge on the sales invoice and warranty card (except for damage caused by neglect).

General Troubles and Problem Solving:

Trouble	Causes	Problem Solving
Power lamp not lit	1.No electricity input 2. Switch of welder fails.	1.Check incoming line 2.Replace the switch
Fan not rotating	1. Fan power line is off. 2. Enclosure blocks the fan due to distortion 3. The fan fails.	1.Reconnect the line 2.Reform the enclosure 3.Replace the fan
Warning lamp lights	1.Over heat (yellow lamp lights) 2.Over current (Green lamp lights)	1. Weld after cooling. 2. Increase input voltage
No output of welder	1.Over current protection 2. Welder fails	1. Over load using 2. Maintenance in manufacturer or service center
Output current decreased	1. Input Voltage is low 2. Input line is too thin	1. Power line is thickened
Current cannot be regulated	1.Connecting line of the potentiometer is off 2.Potentiometer for current regulation fails	1.Reconnect the line 2.Replace potentiometer
High frequency arc cannot be generated	1.The switch fails 2.Interval of high frequency discharging is too big 3.Proximity of torch and work pieces too great 4. High frequency	1.Replace torch switch 2.Regulate discharging interval to 0.8-1.0mm 3.Put torch tungsten electrode close to material 4.Replace high frequency arc generator
Arc of argon welding is broken or tungsten electrode is burnt	1.Argon gas flow is not regulated well 2.Tungsten electrode fails 3. Value of current does not match with dial. of tungsten electrode 4.After flow time is too short	1.Regulate well 2.Replace or sharpen 3.Select the electrode dial and current correctly 4.Increase the time
Welding torch overheat	1. Cannot use the water cooling when the current is more than 160A 2.The argon flow is the low current	1.Use water cooling 2.Increase the argon flow

IX .ACCESSORIES:SEE PACKING LIST PLEASE

PACKING LIST



model	quantity	remark	note
AC/DC315D Welding machine	1		
Welding Holder	1		
Ground clamp	1		
TIG welding torch	1		
Adjustable foot control	1	optional accessory	
gas inlet pipe	1		
Operation instructions	1		
Certificate of quality	1		

No.

Certificate of quality

Name of product: AC/DC/PULSE TIG WELDING

Type of product: AC/DC315D

Packing No: _____

Test results of this welder fulfils_____

_____ **technical requirements and its release**

from the works is granted.

Inspector_____ **Date**_____

			
WARNING	<ul style="list-style-type: none"> ● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground. 	<ul style="list-style-type: none"> ● Keep flammable materials away. 	<ul style="list-style-type: none"> ● Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> ● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> ● Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> ● Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> ● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> ● Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> ● Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> ● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> ● Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> ● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> ● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra. 	<ul style="list-style-type: none"> ● Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> ● Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> ● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> ● 燃えやすいものの側での溶接作業は絶対にはなりません。 	<ul style="list-style-type: none"> ● 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> ● 皮肤或湿衣物切勿接觸帶電部件及鉅條。 ● 使你自已與地面和工作絕緣。 	<ul style="list-style-type: none"> ● 把一切易燃物品移離工作場所。 	<ul style="list-style-type: none"> ● 佩戴眼、耳及身體勞動保護用具。
Korean 위험	<ul style="list-style-type: none"> ● 진도체나 용접봉을 젖은 천길 또는 피부로 절대 접촉치 마십시오. ● 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> ● 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> ● 눈, 귀의 물에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> ● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجلد الجسم أو بالملايس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ● ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> ● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切して下さい。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동치 마십시오. 	Korean 위험
<ul style="list-style-type: none"> ● ابتعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● اقطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغيل هذا الجهاز إذا كانت الإغطية الحديدية الواقية نيمت عليه. 	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.